

JAPAN

EDICT OF GOVERNMENT

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JIS C 9502 (2008) (English): Lighting equipment
for bicycles

ISO INSIDE

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*The citizens of a nation must
honor the laws of the land.*

Fukuzawa Yukichi

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JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS C 9502 : 2008

(JBPI/JSA)

Lighting equipment for bicycles

ICS 43.150; 29.120

Reference number : **JIS C 9502 : 2008 (E)**

Date of Establishment: 1950-09-20

Date of Revision: 2008-11-20

Date of Public Notice in Official Gazette: 2008-11-20

Investigated by: Japanese Industrial Standards Committee
Standards Board

Technical Committee on Consumer Life Products

JIS C 9502:2008, First English edition published in 2009-05

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

In the event of any doubts arising as to the contents,
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Printed in Japan

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Bicycle Promotion Institute (JBPI)/ Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS C 9502** : 1998 is replaced with this Standard.

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Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

Lighting equipment for bicycles

Introduction

This Japanese Industrial Standard has been prepared based on the second edition of **ISO 6742-1** published in 1987. Portions (oblong luminous intensity distribution characteristics, maintenance of dynamo output, environmental performance) corresponding to International Standard are prepared without any modifications of the technical contents; however, items (circular luminous intensity distribution characteristics, running characteristics test, shock resistance, temperature cycle performance, plating or painting, structure and appearance) not specified in the corresponding International Standard are provided as a part of the Japanese Industrial Standard.

The portions given sidelines or dotted underlines are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with the explanations is given in Annex JA.

1 Scope

This Standard specifies the lighting equipment for bicycles mounted on bicycles specified in **JIS D 9111** (hereafter referred to as “lighting equipment”).

This Standard does not apply to the bicycle with a drive assist device among bicycles for general use to which the drive assist function is added, which utilizes a battery for driving the drive assist device also for a power source of a head lamp and a rear lamp. However, items which can be tested solely with a head lamp and a rear lamp may apply.

NOTE : The International Standard corresponding to this Standard is as follows.

ISO 6742-1:1987 *Cycles—Lighting and retro-reflective devices—Photometric and physical requirements—Part 1: Lighting equipment* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS C 1102-2 *Direct acting indicating analogue electrical measuring instruments and their accessories Part 2: Special requirements for ammeters and voltmeters*

JIS C 1609-1 *Illuminance meters Part 1: General measuring instruments*

JIS C 7508 *Torch lamps*

JIS C 7510 *Incandescent lamps for bicycle dynamo lamps*

JIS C 8501 *Carbon zinc batteries*

JIS C 8511 *Alkaline primary batteries*

JIS C 8513 *Safety standard for primary lithium batteries*

JIS C 8705 *Sealed nickel-cadmium rechargeable single cells*

NOTE : Corresponding International Standard: IEC 61951-1 *Secondary cells and batteries containing alkaline or other non-acid electrolytes—Portable sealed rechargeable single cells—Part 1: Nickel-cadmium (MOD)*

JIS C 8708 *Sealed nickel-metal hydride rechargeable single cells*

JIS C 8711 *Secondary cells and batteries containing alkaline or other non-acid electrolytes—Secondary lithium cells and batteries for portable applications*

JIS C 60068-2-6 *Environmental testing Part 2: Tests—Test Fc: Vibration (sinusoidal)*

JIS D 0202 *General rules of coating films for automobile parts*

JIS D 9101 *Cycles—Terminology*

JIS D 9111 *Cycles—Classification and essential characteristics*

JIS D 9419 *Bicycles—Hubs*

JIS H 8502 *Methods of corrosion resistance test for metallic coatings*

JIS H 8610 *Electroplated coatings of zinc on iron or steel*

JIS H 8617 *Electroplated coatings of nickel and chromium*

JIS Z 8701 *Colour specification—The CIE 1931 standard colorimetric system and the CIE 1964 supplementary standard colorimetric system*

JIS Z 8724 *Methods of colour measurement—Light-source colour*

3 Terms and definitions

For the purposes of this Standard, the definitions given in **JIS D 9101**, and the following definitions apply.

3.1 lighting equipment for bicycles

general name of illumination equipment for a bicycle used by being mounted on a bicycle, which is composed of a light of head lamp and/or rear lamp, a power source of dynamo or a battery, and so on

3.2 head lamp

a light which radiates a white beam or a selective yellow beam to indicate the presence of bicycle on the road and to provide illumination of the road ahead to verify obstacles, etc. while running

3.3 rear lamp

a light which radiates a red beam from rear of a bicycle to indicate the presence of a cyclist

3.4 filament lamp

a light source in which light is produced when the filament is heated to incandescence by the passage of an electric current

3.5 LED (light emitting diode)

a type of semiconductor element which emits light by the passage of an electric current

It is also called as the luminescent diode.

3.6 standard light source

general name of light source such as filament lamp and LED clearly specified by the manufacturer to be mounted on the lighting equipment

3.7 dynamo lamp

a lamp of lighting equipment for bicycles which uses the electric current generated from dynamo as a power source and is composed of dynamo, head lamp, rear lamp, cord, dress guard, bracket and so on, provided that rear lamp, cord, dress guard and bracket may be omitted

3.8 dynamo

a power generator for lighting the head lamp and so on rotated by the rotating parts (tyre, rim, etc.) of a bicycle, which includes a hub dynamo

3.9 hub dynamo

a power generator of 3.8 integrated in a hub of a bicycle

3.10 axis of reference

a characteristic horizontal axis of a light determined by the manufacturer to serve as a direction of reference under the normal service conditions and the test measurement conditions (see figure 1)

3.11 centre of reference

intersection of the axis of reference with the light output surface from light (see figure 1)

3.12 beam centre

the area at the centre of the light pattern as viewed on the test screen

3.13 rated voltage

voltage marked on a filament lamp

For LED, voltage of supply side specified by the manufacturer

3.14 reference luminous flux

specific luminous flux of a filament lamp or LED to which the photometric characteristics of light shall be referred

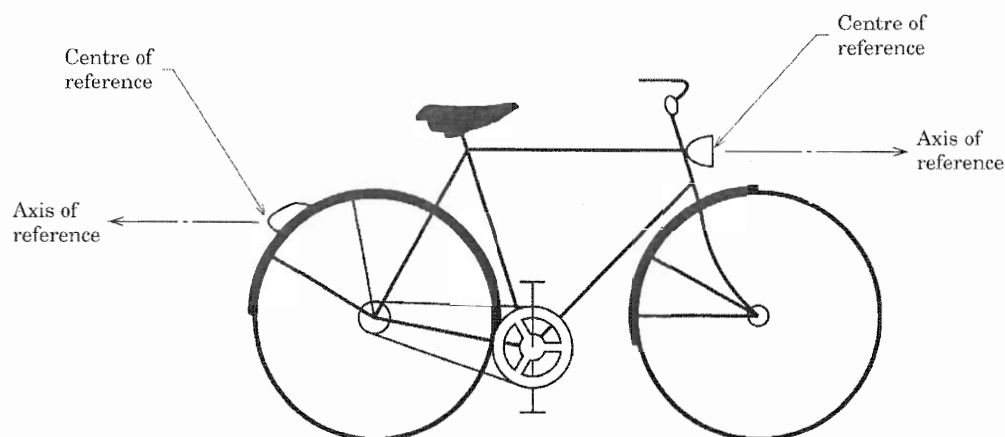


Figure 1 Axis of reference and centre of reference

4 Classification

The lighting equipment shall be classified according to the power source and constitution thereof and shall be in accordance with table 1.

Table 1 Classification of lighting equipment

Type	Power source	Constitution
Type I	Dynamo type	Type consisting of a dynamo, head lamp and rear lamp
Type II		Type consisting of a dynamo other than hub dynamo and head lamp
Type III		Type consisting of a hub dynamo and head lamp
Type IV	Battery type	Type consisting of head lamp using a battery (primary battery or secondary battery) and/or rear lamp using a battery

5 Name of component and constitution

Examples of name of main component and constitution shall be shown in figure 11 to figure 15. The rear lamp, cord, dress guard and bracket may be omitted.

6 Luminous intensity and beam colour of lighting equipment

6.1 Luminous intensity and beam colour of head lamp

6.1.1 Luminous intensity

6.1.1.1 Minimum luminous intensity

The following value or more shall be obtained for the luminous intensity of the head lamp by selecting the luminous intensity distribution characteristics appropriate to that of the head lamp under test from either of the test methods of **14.1.2 a)** and **14.1.2 b)** which specify the measurement point and the luminous intensity value. Also, the lamp shall show no visible evidence of flickering when lighted at the rated voltage.

- a) **Test method 1 (oblong luminous intensity distribution characteristics)** For the luminous intensity of head lamp, when tested in accordance with 14.1.1 and 14.1.2 a), the luminous intensity values *A*, *B* and *C* of the beam at the illuminance measurement points of *A*, *B* and zone *C* on the screen shown in figure 2 shall be as follows.

- 1) The luminous intensity value of measurement point *A* shall be 400 cd or more and shall be 80 % or more of the maximum luminous intensity value I_{\max} of head lamp.

$$400 \text{ cd} \leq A \leq 0.8 I_{\max}$$

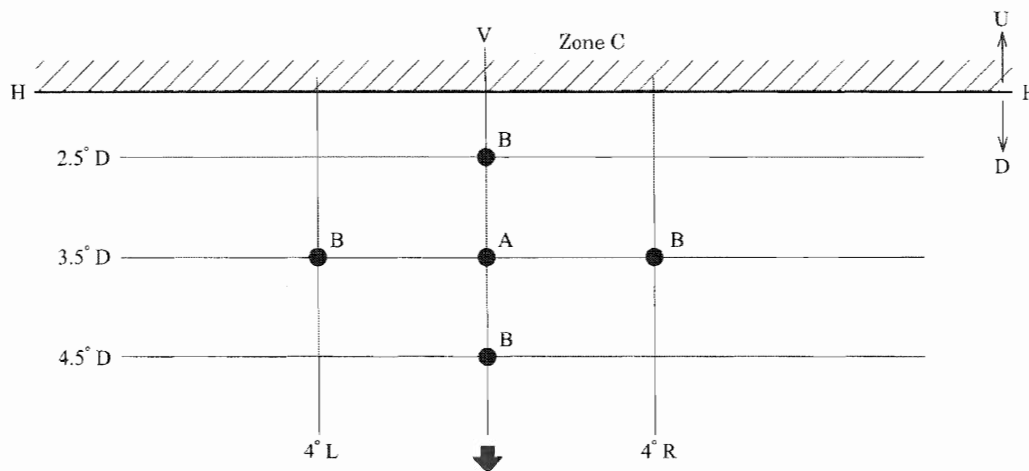
- 2) The luminous intensity shall be $0.5 I_{\max}$ or more at any position within the area bounded by points *B* on plane *V*, and points *B* on plane 3.5° D .

$$B \geq 0.5 I_{\max}$$

- 3) The luminous intensity shall be 0.05 cd or more at any position within the area between 15° U and 15° D and 80° L and 80° R .

- 4) The luminous intensity shall not exceed 120 cd at any position above plane *H*.

$$C \leq 120 \text{ cd}$$



H: horizontal plane through axis of reference

V: vertical plane through axis of reference

U and D: degrees of arc, respectively, above and below horizontal plane

L and R: degrees of arc, respectively, to the left and right of vertical plane

Figure 2 Measurement points of illuminance for test method 1

- b) **Test method 2 (circular luminous intensity distribution characteristics)** For the luminous intensity of head lamp, when tested in accordance with 14.1.1 and 14.1.2 b), the luminous intensity values *A*, *B*, *C*, *D* and *E* of the beam at the illuminance measurement points *A*, *B*, *C*, *D* and *E* on the screen shown in figure 3 shall be as follows.

- 1) The luminous intensity value of measurement point A shall be 400 cd or more and shall be 80 % or more of the maximum luminous intensity value I_{\max} of head lamp.

$$400 \text{ cd} \leq A \leq 0.8 I_{\max}$$

- 2) The average luminous intensity value of measurement points B, C, D and E shall be 100 cd or more and the luminous intensity value of each measurement point shall be 50 cd or more.

$$B, C, D, E \geq 50 \text{ cd}$$

$$\frac{1}{4}(B + C + D + E) \geq 100 \text{ cd}$$

For a two-lamp type each of which can be lighted independently, each lamp shall satisfy the respective value.

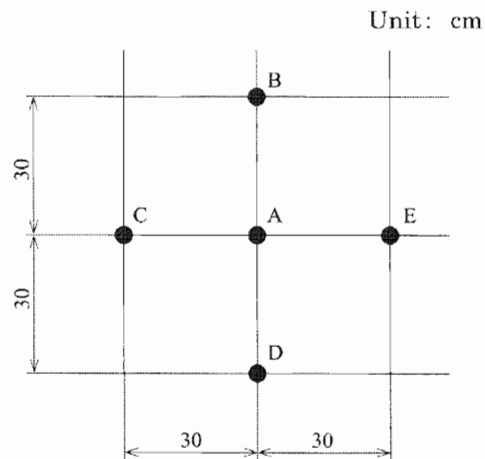


Figure 3 Measurement points of illuminance for test method 2

6.1.1.2 Luminous intensity division and irradiation area division

- a) **Luminous intensity division** For the luminous intensity of head lamp, the luminous intensity distribution characteristics specified in 6.1.1.1 shall be Grade 1 (standard), and those conforming to table 2 shall further be divided into each grade.

Table 2 Division according to luminous intensity

Luminous intensity division	Luminous intensity distribution characteristics			
	Oblong		Circular	
	Measurement point	Luminous intensity	Measurement point	Luminous intensity
Grade 1 (standard)	Point A	400 cd min.	Point A	400 cd min.
			Each point of B, C, D or E	50 cd min.
			Average of points B, C, D and E	100 cd min.
Grade 2	Point A	Double of standard	Point A	Double of standard
			Average of points B, C, D and E	
Grade 3	Point A	Triple of standard	Point A	Triple of standard
			Average of points B, C, D and E	
Grade 4	Point A	Quadruple of standard	Point A	Quadruple of standard
			Average of points B, C, D and E	
Grade 5	Point A	Quintuple of standard	Point A	Quintuple of standard
			Average of points B, C, D and E	
For the oblong type, the luminous intensity at point B shall be $0.5 I_{\max}$ or more and the luminous intensity at zone C shall be 120 cd or under.				

- b) **Irradiation area division** The irradiation area of head lamp shall have a luminous intensity distribution characteristic specified in **6.1.1.1** and **6.1.1.2 a)** as a standard, and that conforming to the requirements of table 3 shall further be divided into a wide angle area.

Table 3 Division according to irradiation area

Irradiation area division	Luminous intensity distribution characteristics			
	Oblong		Circular	
	Measurement point and area	Luminous intensity	Measurement point	Luminous intensity
Wide angle	Within area bounded by points B on plane V and points B' on plane $3.5^\circ D$ (see figure 4)	$I \geq 100 \text{ cd} \times \text{grade number (grade corresponding to luminous intensity division in table 2)}$	Point C' and point E' (see figure 5)	$I \geq 100 \text{ cd} \times \text{grade number (grade corresponding to luminous intensity division in table 2)}$

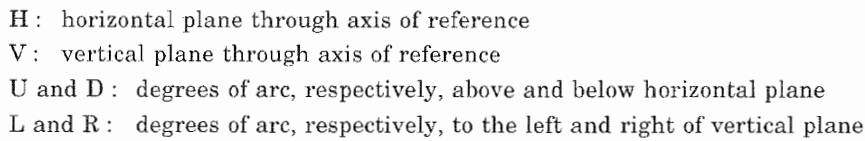


Figure 4 Measurement points of illuminance for test method 1 (wide angle and oblong)

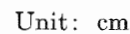


Figure 5 Measurement points of illuminance for test method 2 (wide angle and circular)

6.1.2 Beam colour emitted from head lamp

The beam colour emitted from head lamp shall be white or selective yellow, and shall be in accordance with the following chromaticity coordinates.

- a) **White light** The beam colour, when tested in accordance with 14.1.3, shall be located within the chromaticity area of figure 6 surrounded by chromaticity coordinates of table 4, which is specified in **JIS Z 8701**.

For the head lamp using LED for the light source, it shall be located within the chromaticity area of figure 6 surrounded by chromaticity coordinates of table 5.

Table 4 Chromaticity coordinates defining white light

x	0.285	0.453	0.500	0.500	0.440	0.285
y	0.332	0.440	0.440	0.382	0.382	0.264

Table 5 Chromaticity coordinates defining white light of head lamp using LED for light source

x	0.260	0.440	0.500	0.500	0.440	0.260
y	0.334	0.450	0.450	0.382	0.382	0.245

- b) **Selective yellow light** The beam colour, when tested in accordance with 14.1.3, shall be located within the chromaticity area of figure 6 surrounded by chromaticity coordinates of table 6, which is specified in **JIS Z 8701**.

Table 6 Chromaticity coordinates defining selective yellow light

x	0.466	0.477	0.541	0.524
y	0.500	0.515	0.451	0.442

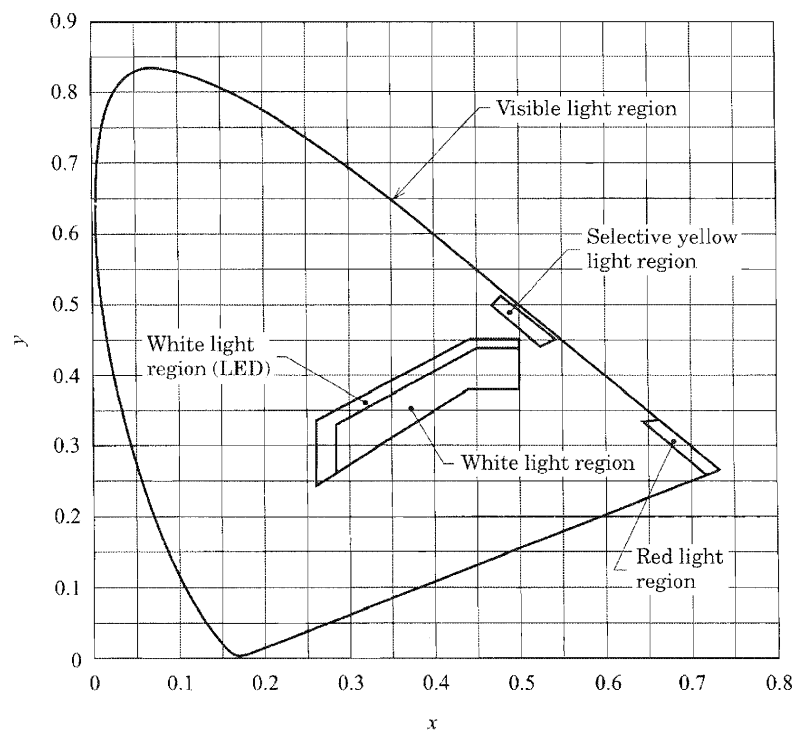


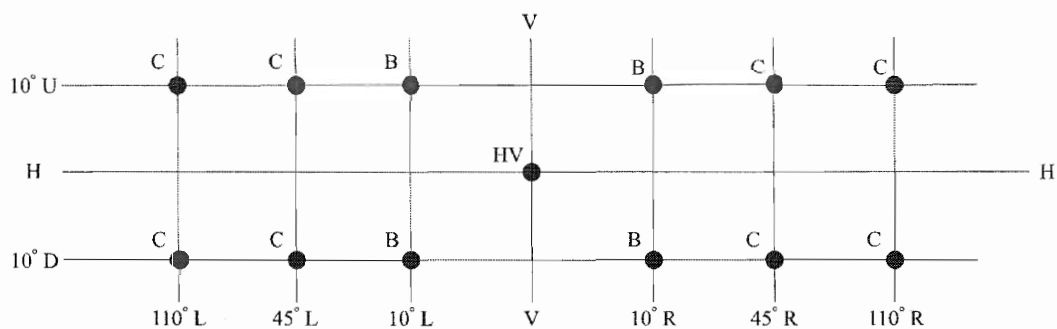
Figure 6 Chromaticity coordinates for each colour area

6.2 Luminous intensity and beam colour of rear lamp

6.2.1 Luminous intensity of rear lamp

The luminous intensity shall conform to the following items when tested in accordance with 14.2.

- a) **Minimum luminous intensity in axis of reference direction** The luminous intensity value at the measurement point HV [intersection of vertical plane (plane V) through axis of reference and horizontal plane (plane H) through axis of reference] on the screen shown in figure 7 shall be 0.75 cd or more when measured by being the axis of reference of rear lamp matched to point HV. Also, the luminous intensity value at the measurement point B shall be 0.10 cd or more, and the luminous intensity value at the measurement point C shall be 0.02 cd or more.



H : horizontal plane through axis of reference

V : vertical plane through axis of reference

U and D : degrees of arc, respectively, above and below horizontal plane

L and R : degrees of arc, respectively, to the left and right of vertical plane

Figure 7 Measurement points of illuminance for rear lamp

- b) **Minimum luminous intensity in upward direction** The rear lamp shall emit the red light upward of luminous intensity of 0.02 cd or more within a cone having a half angle of 45° whose centre axis is vertical to the axis of reference (see figure 8).

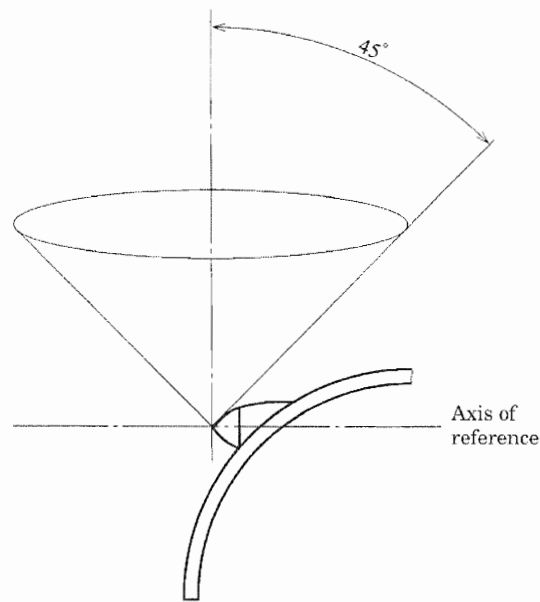


Figure 8 Beam emitted from rear lamp in vertical cone shape

6.2.2 Beam colour emitted from rear lamp

The beam colour emitted from the rear lamp shall be red light and, when tested in accordance with **14.2.3**, it shall be located within the chromaticity area of figure 6 surrounded by chromaticity coordinates of table 7, which is specified in **JIS Z 8701**.

Table 7 Chromaticity coordinates defining red light

x	0.645	0.665	0.735	0.721
y	0.335	0.335	0.265	0.259

7 Dynamo

7.1 Ratings

The rated voltage and rated output of dynamo lamp shall be expressed by the voltage and output of dynamo at a bicycle speed of 15 km/h.

The rated voltage and rated output of hub dynamo shall be the case where the tyre designation is 26 for the standard wheel and 22 for the small-size wheel.

The rated voltage and rated output of dynamo lamp using the filament lamp as a light source shall be in accordance with table 8. The rated voltage and rated output of dynamo lamp using LED as a light source should conform to table 8.

Table 8 Ratings

Division	Rated voltage V	Rated output W
For one-lamp type	6	2.4
	6	3
	6	6
For two-lamp type	6	3.2, 3.2

7.2 Output characteristics

For dynamo, when tested in accordance with 14.3, the output characteristics shall conform to either **a)** or **b)** according to the dynamo type.

- a) Applicable to dynamo specified as Type I** The terminal voltage of dynamo shall fall between the minimum value and the maximum value specified in table 9.

Table 9 Output characteristics

Bicycle speed km/h	Ratio of terminal voltage to rated voltage %	
	Minimum value	Maximum value
5	50	117
15	85	117
30	95	117

- b) Applicable to dynamo specified as Type II or Type III**

- 1) **Reference running characteristics** The difference between the terminal voltage of dynamo¹⁾ and the rated voltage at a bicycle speed of 15 km/h shall not exceed ± 5 % of the rated voltage.

Note ¹⁾ If the voltage changes due to the instantaneous short circuiting of dynamo terminals, the terminal voltage after the instantaneous short circuit shall apply.

- 2) **Low-speed running characteristics** The terminal voltage of dynamo at a bicycle speed of 5 km/h shall be 41 % or more of the terminal voltage at a speed of 15 km.
- 3) **High-speed running characteristics** The terminal voltage of dynamo at a bicycle speed of 30 km/h shall be 133 % or under of the terminal voltage at a speed of 15 km.
- 4) **Continuous running characteristics** The running characteristic of dynamo after the procedure that it is operated at a bicycle speed of 30 km/h continuously for 8 h, then allowed to stand until it returns to the ordinary temperature shall conform to 1) to 3), and there shall be no abnormality at any part.

7.3 Maintenance of dynamo output

When operated continuously for 1 h at a speed equivalent to 15 km/h with a manganin wire resistor attached as calculated from the resistor value of table 10 or the rated voltage and rated output of dynamo lamp, the terminal voltage shall not drop to 85 % or under of the rated voltage.

8 Battery

8.1 Primary battery

8.1.1 Specification

The primary battery attached to the lighting equipment shall be in accordance with JIS C 8501, JIS C 8511, JIS C 8513 and so on according to the type.

8.1.2 Maintenance of luminous intensity

8.1.2.1 Primary battery operated head lamp

After having been subjected to the test of 14.4, the luminous intensity value at measurement point A in figure 2 or figure 3 shall be 100 cd or more.

When the voltage of the standard light source is measured under the full load condition (i.e. including all illumination equipment, if there are other lights) after being operated for 10 h continuously on full load, and when the luminous intensity value of the beam at measurement point A according to that voltage is 100 cd or more, this requirement shall be deemed to be accepted.

8.1.2.2 Primary battery operated rear lamp

After having been subjected to the test of 14.4, the luminous intensity value at measurement point HV shown in figure 7 shall be 0.25 cd or more.

When the voltage of the standard light source is measured under the full load condition (i.e. including all illumination equipment, if there are other lights) after being operated for 10 h continuously on full load, and when the luminous intensity value of the beam at measurement point HV according to that voltage is 0.25 cd or more, this requirement shall be deemed to be accepted.

8.2 Secondary battery

8.2.1 Specification

The secondary battery attached to the lighting equipment shall be in accordance with JIS C 8705, JIS C 8708, JIS C 8711 and so on according to the type.

8.2.2 Maintenance of luminous intensity

8.2.2.1 Secondary battery operated head lamp

After having been subjected to the test of 14.5, the luminous intensity shall be the value specified in 6.1.1.1 or more when the final measured voltage is applied to the standard light source, or to the system if the battery operated head lamp is a part of the system.

8.2.2.2 Secondary battery operated rear lamp

After having been subjected to the test of **14.5**, the luminous intensity shall be the value specified in **6.2.1 a)** or more when the final measured voltage is applied to the standard light source or, or to the system if the battery operated rear lamp is a part of the system.

9 Switch performance (where applicable to battery operated head lamp)

9.1 Requirement 1

The action of the switch of the battery operated head lamp shall be positive, and the ON-OFF positions shall be definite for the one in which ON and OFF is changed by shifting the switch. Operation of this switch shall not cause battery movement. The filament lamp shall show no visible evidence of flickering when switched to either the ON or OFF position, or, in the case of a screw type, when the switch is fully in or out.

9.2 Requirement 2

The switch of the battery operated head lamp shall satisfy the requirement of **9.1** after the test by making and breaking the circuit 5 000 times under the rated voltage condition. If the battery should fail, it shall be replaced and the test shall be continued.

10 Environmental performance

10.1 Vibration resistance for lighting equipment

The lighting equipment shall conform to the following items, when tested in accordance with **14.6.1**.

- a) The head lamp and the rear lamp shall not become loose or detached from its mounting during the test. After the test, the head lamp and the rear lamp shall function correctly and shall not show evidence of material weakness or displacement of components. If the filament in the lamp is broken, the filament lamp shall be replaced to check the performance after the test. Loosening of the filament lamp or other failure shall be deemed as the failure of the head lamp.
- b) The dynamo shall not become loose or detached from its mounting during the test. After the test, the dynamo shall function correctly and conform to **7.2**.

10.2 Shock resistance for head lamp

For the shock resistance of the head lamp, there shall be no abnormalities on its construction, when tested in accordance with **14.6.2**, provided that dent caused on the head case is permitted.

10.3 Temperature performance for lighting equipment

The lighting equipment, when tested in accordance with **14.6.3**, shall conform to the following requirements, respectively.

- a) The head lamp shall function correctly after the test and conform to **6.1**.
- b) The rear lamp shall function correctly after the test and conform to **6.2**.

- c) The dynamo shall function correctly after the test and conform to **7.2**.

10.4 Moisture resistance for lighting equipment

The lighting equipment, when tested in accordance with **14.6.4**, shall conform to the following requirements, respectively.

- a) The head lamp shall function correctly after the test and conform to **6.1**.
- b) The rear lamp shall function correctly after the test and conform to **6.2**.
- c) The dynamo shall function correctly after the test and conform to **7.2**.

10.5 Corrosion resistance for lighting equipment

The lighting equipment, when tested in accordance with **14.6.5**, shall function correctly and be free from corrosion detrimental to use.

10.6 Fuel oil resistance for head lamp and rear lamp

The head lamp and rear lamp, when tested in accordance with **14.6.6**, the lens surface shall not show any visible signs of deterioration other than slight local surface crazing.

10.7 Cyclic temperature change performance for lighting equipment

A dynamo lamp which uses the electric current generated by a dynamo as the power source shall conform to each item in clause **12**, when tested in accordance with **14.6.7**.

10.8 High-speed running performance for head lamp

A head lamp with the LED light source and electric circuit among dynamo lamps using a dynamo, when tested in accordance with **14.6.8**, shall function correctly and conform to **6.1**.

11 Plating and painting

11.1 General

There shall be no exposure of substrate, peeling, rust, crack or other significant defects on the surface treated with plating or painting.

11.2 Painting

The appearance of painted surface shall be visually examined, and the breakage of painted film shall not be found when the resistance to scratch by a pencil of hardness F is tested in accordance with **4.13** of **JIS D 0202**.

11.3 Plating

- a) The plating thickness and corrosion resistance of the portion plated with nickel or nickel and chromium shall be Grade 2 or more specified in table 2 of **JIS H 8617**.
- b) The plating thickness and corrosion resistance of the portion electroplated with zinc shall be Grade 2 or more specified in table 1 of **JIS H 8610**.

12 Constitution

The constitution of lighting equipment, when tested in accordance with **14.7**, shall conform to the following items, provided that items irrelevant to the product are not applicable.

- a) Every part of lighting equipment shall be so constructed that waterproof and dustproof treatments shall be provided, and loosening, damage, electrical mal-contact, mal-connection, etc. will not appear due to the vibration caused by running.
- b) The armature winding of dynamo shall be sufficiently insulated, and phenol resin or an insulating material equivalent or superior thereto in resistance to moisture shall be used for each terminal.
- c) The dynamo bracket shall have enough strength to service when the dynamo is mounted and shall be so constructed that the electrical contact with bicycle frame is sufficient, if the frame is used as a part of wiring.
- d) The dynamo shall be so constructed that no slip will occur between the roller and the tyre or the roller and the rim under normal service conditions. It also shall be so constructed that the roller shall be capable of separating from the tyre or the rim completely when not in use, and the dynamo will not easily operate due to shock when running of the bicycle. However, the hub dynamo is excluded.
- e) The head lamp having an automatic function of putting on and putting off shall be so constructed that the head lamp firmly puts on³⁾ in night time and at a dark place where the visibility is 50 m or less²⁾. Such head lamp shall not operate easily due to the shock, etc. while running.

Notes ²⁾ "a dark place where the visibility is 50 m or less" means a tunnel inside, a place of dense fog, and the like.

³⁾ "so structured that the head lamp firmly puts on" means the constitution enabling an automatic lighting even in a place of dense fog or, if not lighting automatically, enabling forced manual lighting.

- f) The head lamp having an automatic function of putting on and putting off shall have a function of putting on the lamp manually and forcibly⁴⁾ on rider's own will, whenever the rider judges that it is dark.

Note ⁴⁾ This function of putting on the light manually and forcibly shall apply from January 1st, 2011.

- g) The performance and constitution of the hub for bicycle where hub dynamo system is employed shall conform to the requirements of **JIS D 9419**.
- h) The reflecting mirror of the head lamp shall be so constructed that it is suitable for converging reflection of light, and is treated with a good surface treatment and does not cause flaws, strains, etc. easily.
- i) The filament lamp of lighting equipment which uses a filament lamp as its light source shall have the performance as specified in **JIS C 7508** and **JIS C 7510** equivalent or superior thereto, and shall conform to the rating of the lighting equipment. However, those filament lamps used in a two-lamp type head lamp

with the rated voltage of 6 V and the rated output of 3.2 W shall have the performance of D6V3WE or D6V3WEP specified in 1.4 of JIS C 7510 or equivalent.

- j) The lighting equipment using a filament lamp as its light source shall be so constructed that a spare filament lamp can be accommodated.
- k) The lighting equipment using a battery as its power source should be equipped with an indicator which shows the replacement timing of primary battery or battery charging timing of the secondary. The indicator shall output the signal before the luminous intensity value of the beam at the measurement point A becomes 100 cd.
- l) The joint of the cord shall be capable of withstanding a tensile force of 10 N in every direction.

13 Appearance

The appearance of lighting equipment shall conform to the following items, when tested in accordance with 14.7.

- a) The portion easily touched by hands at the time of operation, cleaning, etc. shall be smooth and free from flashes, burrs, etc.
- b) There shall be no significant flaw, exposure of substrate, peeling, rust, crack or other significant defects on the surface treated with plating or painting.
- c) Portions not subjected to surface treatment such as painting or plating, or the substrate surface shall be free from rusts, crack, significant flaw or other significant defects.

14 Test method

14.1 Luminous intensity test for head lamp

14.1.1 Lighting equipment for luminous intensity test

The head lamp for luminous intensity test shall be fitted with a standard light source and shall be operated with the test voltage as specified in 14.1.2 a) 1).

14.1.2 Measurement of luminous intensity

- a) **Test method 1 (oblong luminous intensity distribution characteristics)**
The illuminance of the beam on measurement points A and B on the screen and zone C shall be measured with the beam centre of head lamp being matched to the measurement point A on the vertical plane (plane V) through the axis of reference 3.5° below the horizontal plane (plane H) as shown in figure 2, then the luminous intensity values A, B and C shall be obtained.

The measurement of luminous intensity shall be made using a distance large enough for the inverse square law to be effective. The light source shall be deemed as the centre of reference of the head lamp. The light receiver shall subtend an angle of between 10' and 1° at the centre of reference of the head lamp. The measurement point A (3.5° D on plane V) shall be within the beam centre. The geometric tolerance may be 15' at all points other than the beam centre.

- 1) **Test voltage** The test voltage shall be the rated voltage of substantially sinusoidal AC (frequency of 50 Hz or 60 Hz) or the rated voltage of DC. Also, a dynamo may be operated so as to be generating the rated voltage.

In the case of a head lamp using a battery, the initial voltage (under full load condition) of the unused primary battery (within the recommended use-by date) or of the charged secondary battery shall be measured and deemed as the test voltage.

- 2) **Illuminance meter** The illuminance meter of Class A specified in **JIS C 1609-1** or those equivalent or superior thereto in performance shall be used.
- 3) **Illuminance measurement** The illuminance measurement shall be carried out at each measurement point when the characteristics are almost stabilized after lighting the filament lamp for about 10 min or the LED lamp for about 30 min.
- 4) **Calculation of luminous intensity value** The luminous intensity value shall be calculated by the following equation.

$$I = EL^2$$

where, I : luminous intensity value (cd)
 E : illuminance value (lx)
 L : measurement distance (m)

- b) **Test method 2 (circular luminous intensity distribution characteristics)**
In the measurement of luminous intensity (luminous intensity test), the illuminance of the beam on the measurement points on the screen (A, B, C, D and E) shall be measured with the head lamp-to-screen distance set at 5 m and the beam centre of head lamp being matched to the intersection A of the vertical plane and the horizontal plane on the screen as shown in figure 3, and the luminous intensity values A, B, C, D and E shall be obtained.

The test voltage, the illuminance meter, illuminance measurement and calculation of a luminous intensity value shall be in accordance with **14.1.2 a) 1) to 4)**.

14.1.3 Beam colour emitted from head lamp

The colour of beam emitted from the head lamp shall be obtained using the chromaticity coordinates (x,y) in accordance with **JIS Z 8724**. Instead of this measurement, the beam colour emitted may be visually compared with the beam colour within the area of the chromaticity coordinates as shown in table 4, table 5 or table 6 by combining the light source close to the standard light A specified in **JIS Z 8701** with standard limit filters.

14.2 Luminous intensity test for rear lamp

14.2.1 Lighting equipment for luminous intensity test

The rear lamp for luminous intensity test shall be fitted with a standard light source and shall be operated as its reference luminous flux for the rated voltage, as specified by the manufacturer. The reference luminous flux shall be 2 lm.

14.2.2 Measurement of luminous intensity

The measurement of luminous intensity shall be made using a distance large enough for the inverse square law to be effective. The light source shall be deemed as the centre of reference of the rear lamp. The light receiver shall subtend an angle of between 10' and 1° at the centre of reference of the rear lamp. The measurement point HV shall be within the beam centre. The geometric tolerance may be 15' at all points other than the beam centre.

The illuminance meter, illuminance measurement and calculation of a luminous intensity value shall be in accordance with 14.1.2 a) 2) to 4).

14.2.3 Beam colour emitted from rear lamp

The colour of beam emitted from the rear lamp shall be obtained using the chromaticity coordinates (x,y) in accordance with JIS Z 8724. Instead of this measurement, the beam colour emitted may be visually compared with the beam colour within the area of the chromaticity coordinates as shown in table 7 by combining the light source close to the standard light A specified in JIS Z 8701 with standard limit filters.

14.3 Operation characteristics test of dynamo

The operation characteristics test shall be carried out under the following test condition.

- a) **Operation method** The dynamo shall be operated with being mounted on the bicycle or by a method corresponding thereto.
- b) **Test load** A resistor of manganin wire with the resistance value specified in table 10 or that calculated from the rated voltage and rated output of the dynamo lamp shall be used as the test load. The tolerance on the resistance value shall be $\pm 0.5\%$.

Table 10 Test load

Division	Rated voltage, rated output	Resistance value Ω
For one-light type	6 V 2.4 W	15
	6 V 3 W	12
	6 V 6 W	6
For two-light type	6 V 3.2 W, 3.2 W	11.25, 11.25

- c) **Voltmeter** The rectifier type voltmeter of class index 1.0 specified in JIS C 1102-2 or a low consumption voltmeter equivalent or superior thereto in performance which gives accurate r.m.s. value shall be used.

The internal resistance of the voltmeter shall be included in the fixed resistive load.

- d) **Ambient temperature** The ambient temperature shall be $20\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$.

14.4 Maintenance test of luminous intensity for primary battery operated head lamp and rear lamp

The standard light source and the unused primary battery (within the recommended use-by date) shall be mounted on the lighting equipment to be tested. The test shall be carried out at an ambient temperature of $20\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ and at the relative humidity of $(60 \pm 15)\%$.

The standard light source shall be operated on full load (i.e. including all illumination equipment, if there are other lights) for 30 min continuously, once per day for 5 consecutive days per week for 4 weeks (i.e. a total of 10 h operation).

The voltage on full load shall be measured at the end of this test period, and the luminous intensity shall be tested using this voltage.

14.5 Maintenance test of luminous intensity of secondary battery operated head lamp and rear lamp

The battery shall be charged in accordance with the instructions supplied with the equipment⁵⁾. The standard light source shall be mounted on the lighting equipment to be tested.

The voltage shall be measured on full load. The equipment shall be operated until this voltage drops to 75 % of the initial voltage.

According to the instructions, the battery shall be recharged and the lighting equipment shall be left for 24 h to 30 h at a temperature of $20\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$.

The lighting equipment shall be operated at a temperature of $20\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ for the maximum use duration indicated by the manufacturer as marked on the equipment.

The voltage on full load shall be measured at the end of this test period, and the luminous intensity shall be tested using this voltage.

Note ⁵⁾ Where the equipment is part of a system of the lighting equipment, for “lighting equipment” read “system”.

14.6 Environmental resistance test

In each test, the lighting equipment shall be tested under such a state that it is fixed with appropriate brackets as mounted on a bicycle. The lighting equipment of which the power source is a battery shall be tested under such a state that a battery is attached. Unless otherwise specified, the test condition shall be at an ambient temperature of $23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ and at the relative humidity of $(65 \pm 20)\%$.

14.6.1 Vibration resistance test for lighting equipment

14.6.1.1 Principle

The lighting equipment shall be mounted in a similar way as its intended mounting on a bicycle, and subjected to the repetitive vibration to simulate the use of bicycle on the road for the an accelerated time.

14.6.1.2 Testing apparatus and test method

The testing apparatus and test method shall be selected from the following [a) and b)] which is appropriate.

a) **Test method 1**

- 1) **Testing apparatus** The testing apparatus shall be a vibration test machine as shown in figure 9 having the following characteristics.

The table of the vibration test machine shall be spring-mounted at one end and fitted with steel caulks on the underside of the other end. The caulks shall make contact with a steel anvil once during each cycle at the completion of the fall of the table.

The load at the point of contact shall be 265 N or over to and including 310 N by means of adjustable tension springs positioned between the cam and the spring-mounted end of the table. It also be adjusted so that caulks on the underside shall be 3 mm lifted from the steel anvil.

- 2) **Test method** The lighting equipment shall be mounted to the vibration test machine in a position similar to its normal operating position by the designed method to be fitted to a bicycle, then it is vibrated under the condition of table 11.

For the hub dynamo, the test shall be carried out so that the hub axis part is mounted on the vibration test machine in unit or of the condition integrated with the wheel.

Table 11 Vibration test

Condition	Description
Duration of test min	60
Frequency Hz	11.7 to 13.3

Unit: mm

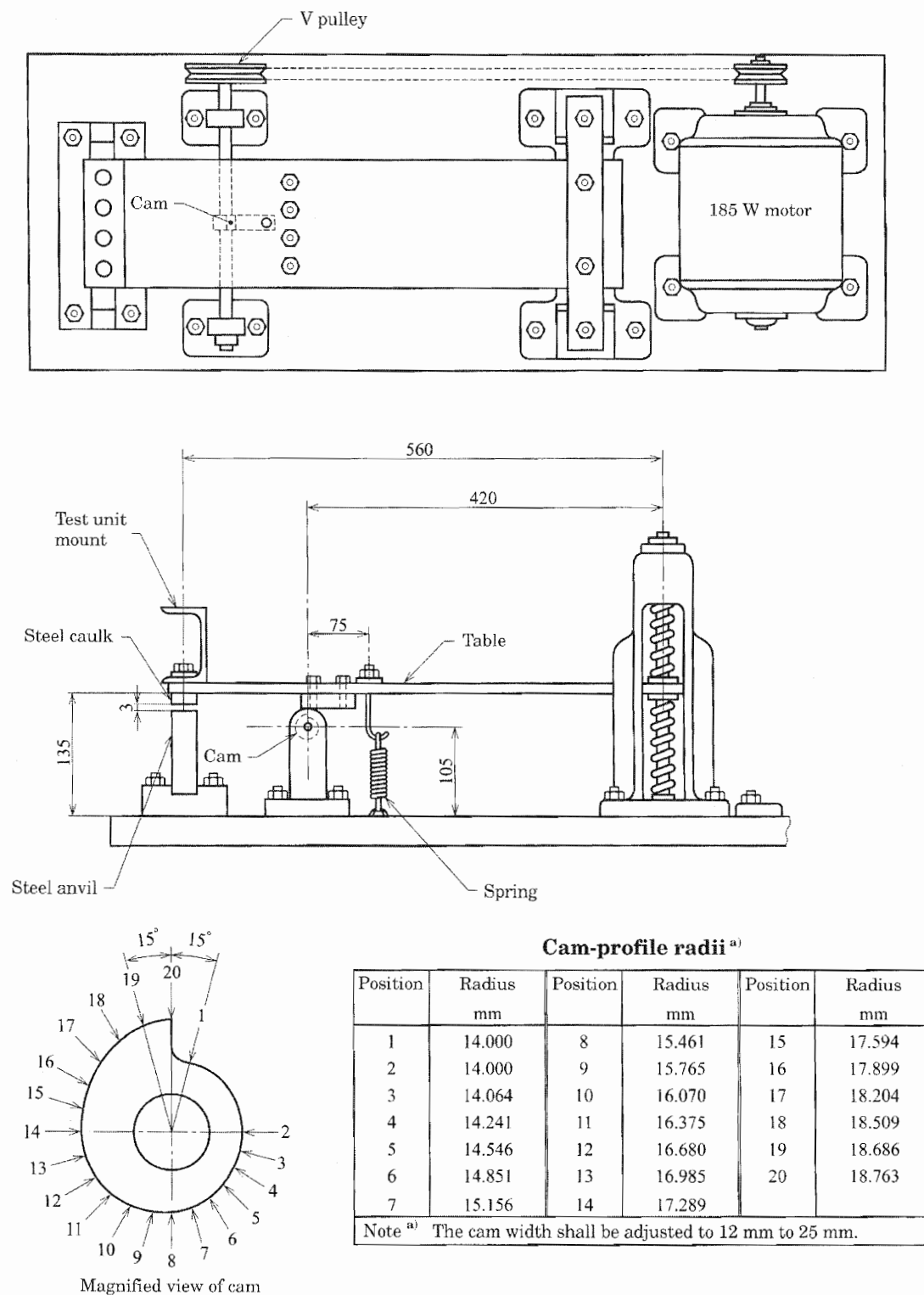


Figure 9 Vibration test machine

- b) **Test method 2** The lighting equipment shall be mounted to the vibration test machine in a position similar to its normal operating position by the designed method to be fitted to a bicycle, then it is vibrated under the condition of table 12 by the method specified in **JIS C 60068-2-6**.

For hub dynamo, the test shall be carried out so that the hub axis part is mounted on the vibration test machine in unit or of the condition integrated with the wheel.

Table 12 Vibration test

Condition		Description
Duration of test	min	60
Acceleration	m/s ²	30
Frequency of vibration	Hz	11.7 to 20
Total amplitude	mm	11 to 4
Vibration direction		Upward and downward

14.6.2 Shock resistance test for head lamp

The shock resistance test for the head lamp shall be carried out so that the head lamp is placed on a wooden board with flat surface having a thickness of 10 mm or more as shown in figure 10, a steel ball having a diameter of about 20 mm and a mass of about 36 g is dropped from a height of 1 m above the head lamp onto the upper face and both side faces of the head lamp once each, then the existence of abnormalities shall be examined.

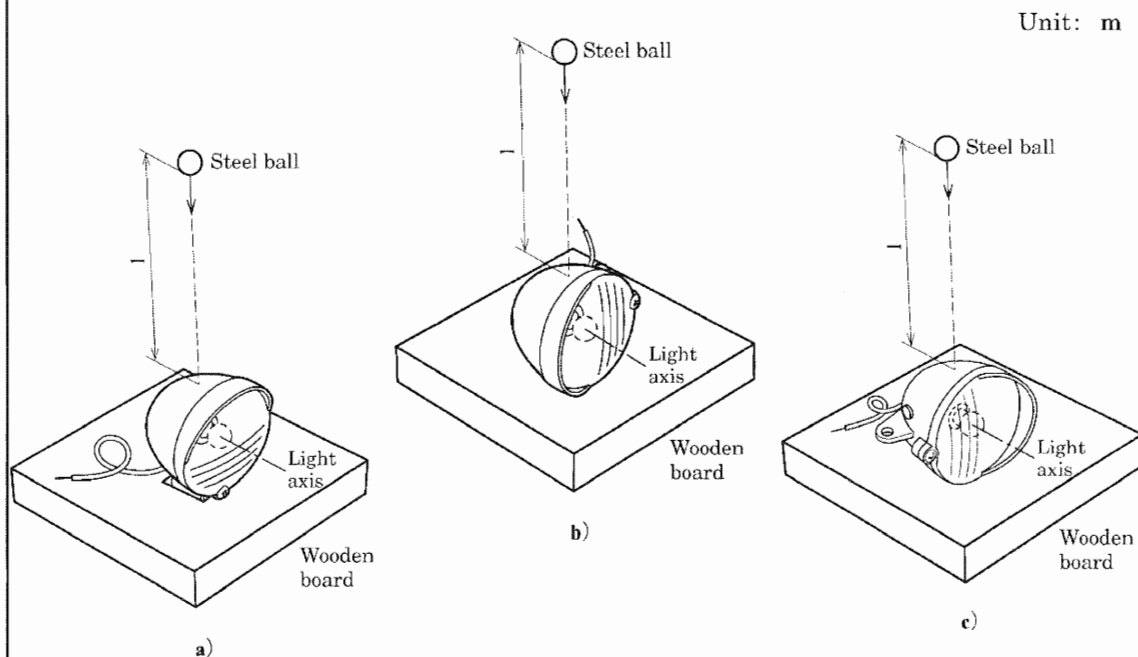


Figure 10 Shock resistance test for head lamp

14.6.3 Temperature test of lighting equipment

The head lamp, rear lamp and/or dynamo shall be placed in the atmosphere of 50^{+5}_0 °C for 2 h, then left at ambient temperature until the condition stabilizes.

The filament lamp shall be removed from the head lamp and/or rear lamp, wiped to be clean (the product is removed), lighted at the rated voltage for 5 min, then integrated in the head lamp and/or rear lamp again. Further, the head lamp and/or rear lamp shall be lighted at 117 % of the rated voltage for 1 h, then the existence of abnormalities shall be examined.

14.6.4 Moisture resistance test for lighting equipment

14.6.4.1 Moisture resistance testing apparatus

The testing apparatus equipped with the water spray cabinet having a revolving mount capable of mounting the head lamp, rear lamp and/or dynamo and meeting the following requirements shall be used.

The head lamp, rear lamp and/or dynamo under test shall be revolved about a vertical axis to the apparatus at a rate of 4 revolutions per minute. Water at $20\text{ °C} \pm 10\text{ °C}$ shall be sprayed on the mounted head lamp, rear lamp and/or dynamo at an angle of 45° directed downwards at a precipitation rate of 2.5 mm per minute.

14.6.4.2 Moisture resistance test

The head lamp, rear lamp and/or dynamo shall be mounted in their normal operating positions, and all drain holes shall be opened. Water shall be sprayed to the head lamp, rear lamp and/or dynamo for 6 h continuously. At the end of this period, water draining from the head lamp, rear lamp and/or dynamo shall be carried out for 1 h. Then, whether they function correctly or not shall be examined.

14.6.5 Corrosion resistance test for lighting equipment

For the corrosion resistance test, the duration of the test shall be 50 h as specified in **JIS H 8502**. The method shall be so that the exposure of 24 h shall be carried out twice separated by an interval of 2 h (for drying the head lamp, rear lamp and/or dynamo). Then, the existence of corrosion detrimental to use shall be examined.

14.6.6 Fuel oil resistance test for head lamp and rear lamp

A mixture of 70 % of *n*-heptane and 30 % of toluene in volume ratio shall be prepared for the fuel oil resistance test. A cotton cloth shall be soaked in this mixture, the outer surface of the lens shall be wiped with this cotton cloth, the lens shall be left to dry naturally for 5 min, then the visual inspection shall be carried out.

14.6.7 Cyclic temperature change test for lighting equipment

For the cyclic temperature test, 2 cycles of the cycle in which the condition of table 13 is deemed as 1 cycle, then the existence of abnormalities shall be examined.

Table 13 Cyclic temperature change test for lighting equipment

Temperature °C	Time min
+50	60
Ordinary temperature	30
-20	60
Ordinary temperature	30

14.6.8 High-speed running test for head lamp

The bicycle shall be run for 30 min continuously at a speed of 30 km/h with the head lamp being connected with the dynamo and with the light being put on, and the existence of abnormalities shall be examined. In the case of a hub dynamo, further continuous 30-min run shall be made while the light is put off, and the existence of abnormalities shall be examined.

14.7 Constitution and appearance test

The constitution and appearance test shall be carried out visually, etc. The tensile force of the joint of the cord shall be verified by a push-pull gauge, etc.

15 Designation of products

The product shall be designated by the name, light source of head lamp, luminous intensity division, irradiation area division, luminous intensity distribution characteristics, light source of rear lamp, power source, rated voltage and rated output as shown in table 14. However, the light source division for the filament lamp, the luminous intensity division for the standard type (Grade 1) and the irradiation area division for a standard type may be omitted.

Table 14 Designation of products

Designation	Head lamp					Rear lamp	Power source	Rated voltage and rated output ^{c)}
	Light source ^{a)}	Luminous intensity division ^{b)}	Irradiation area division	Shape	Luminous intensity distribution characteristics	Light source		
Lighting equipment or lamp for bicycle	[Filament lamp]	[Grade 1]	[Standard]		Oblong luminous intensity distribution characteristics	[Filament lamp]	Dynamo type	6 V 3 W
	Halogen lamp	Grade 4	Wide angle			Halogen lamp	Primary battery ^{d)}	
	Xenon lamp				Circular luminous intensity distribution characteristics	Xenon lamp	Secondary battery	
	LED					LED		

Notes ^{a)} Number of lamps shall be indicated for two-lamp type.

^{b)} Luminous intensity division shall be in accordance with table 2.

^{c)} The rated voltage and rated output for a dynamo lamp shall be in accordance with table 8.

^{d)} In the case of a battery type, the statement may be dry-cell battery or rechargeable battery.

Example 1 Lighting equipment for bicycles — Head lamp of circular luminous intensity distribution characteristics — Primary battery type (6 V 3 W)

Example 2 Lamp for bicycle — two-lamp type LED head lamp of Grade 4, wide angle and circular luminous intensity distribution characteristics — Dynamo type (6 V 2.4 W)

Example 3 Lighting equipment for bicycles — LED rear lamp — Dry-cell battery type (3 V 1.25 W)

16 Marking

16.1 Marking on product

16.1.1 Head lamp and rear lamp

The following items shall be indelibly marked on a conspicuous position of the head lamp and the rear lamp.

a) Rated voltage (V) ⁶⁾

b) Rated output (W) ⁶⁾

Note ⁶⁾ For that using a filament lamp, the type of filament lamp as specified in **JIS C 7508** and **JIS C 7510** may be marked (example: 2.5V0.3ABK, D6V2.4WE).

c) Manufacturer's name or its abbreviation ⁷⁾

d) Year and month of manufacture or its abbreviation ⁷⁾

e) Number of this Standard (**JIS C 9502**) ⁷⁾

Note ⁷⁾ It may be omitted for the dynamo lamp in which the head lamp and dynamo are unified.

16.1.2 Dynamo

The following items shall be indelibly marked on a conspicuous position of dynamo or dress guard surface by stamping, embossing or putting a seal.

- a) Rated voltage (V)
- b) Rated output (W)
- c) Manufacturer's name or its abbreviation
- d) Year and month of manufacture or its abbreviation
- e) Number of this Standard (JIS C 9502)

16.1.3 Battery case

The following items shall be indelibly marked on a conspicuous position of the case surface of those using the interchangeable battery.

- a) Type of battery
- b) Number of batteries

16.1.4 Secondary battery system

For the battery pack or the unified lighting equipment, the following items shall be durably and visibly marked on its lighting equipment by stamping, embossing, putting a seal and the like in lettering at least 3 mm in height.

The maximum use duration before recharging⁸⁾: h

Note ⁸⁾ The maximum use duration by the secondary battery represents the continuous period of time that the battery, when new and fully charged, will provide the voltage necessary to produce the luminous intensity specified in 8.2.2, and it shall be displayed according to the manufacturer's reference.

16.2 Marking on package

The following items shall be marked on the package, outer case or header by printing, stamping or attaching a certification label or a shipping tag. For dealing between manufacturers, however, the marking on the package may be omitted under the agreement between the interested parties.

- a) Designation of product, rated voltage (V) and rated output (W)
- b) Manufacturer's name or its abbreviation
- c) Maximum use duration⁹⁾ when primary battery is used [the battery used and the measurement condition shall be clearly specified (e.g. continuous lighting for ○○ h with alkaline battery)], and maximum use duration before recharging when secondary battery is used.
- d) Number of this Standard (JIS C 9502)

Note ⁹⁾ The maximum use duration by the primary battery represents the continuous period of time that the new battery will provide the voltage necessary to produce the luminous intensity specified in **8.1.2**, and it shall be displayed according to the manufacturer's reference.

An irradiation area (indicated on a XY grid sheet whose square grid size is 30 cm on each of the sides) of 4 lx on the screen at a distance of 5 m should be marked on the package, outer case or header of the lighting equipment.

17 Instructions

The instructions which clearly specifies the following notes on use shall be supplied with each light or system. Additional information may be provided or inapplicable information may be omitted at the discretion of the manufacturer.

a) Instructions shall be read thoroughly and be kept thereafter.

If the bicycle is used by a child, the guardian shall read instructions and teach the child of precautions for use.

b) Method for mounting the lighting equipment to bicycle

c) Operating method

d) When a secondary battery is used as a power source, type of a charger to be used, recommended charging procedure, warning against overcharging or other foreseeable types of abuse that could damage the battery, expected life of the battery and recommended annual check for deterioration

e) Cautions when the bicycle is not used for a long time (the battery storage method, etc.)

f) Instructions for component replacement and its procedure, including conformity types ¹⁰⁾ of filament lamp, LED and battery

Note ¹⁰⁾ The conformity type of filament lamp and battery shall also be marked on the lighting equipment.

g) The maximum use duration when the primary battery is used (the battery used and the measurement condition shall be clearly specified), and maximum use duration when the secondary battery is used before recharging

h) For that having an indicator, approximate time required for the beam to reach the luminous intensity of 100 cd at the measurement point A after the signal has been output

i) Risks and illegality of running without lighting in night time

j) Verification before riding

1) Verification of head lamp and rear lamp for lighting

2) Verification of head lamp of mounting condition and angle

3) Verification of basket or load which does not block the beam from head lamp

k) Address, phone number and facsimile number of consultation service counter for user

No.	Name of component
1	Dress guard
2	Dynamo
2-1	Dynamo case
2-2	Roller
2-3	Terminal
2-4	Swing lever
3	Bracket
4	Head lamp
4-1	Lens
4-2	Head case
4-3	Reflecting mirror
4-4	Filament lamp
4-5	Terminal
4-6	Lamp holder
4-7	Bracket
5	Cord
6	Rear lamp
6-1	Lens
6-2	Case
6-3	Bracket

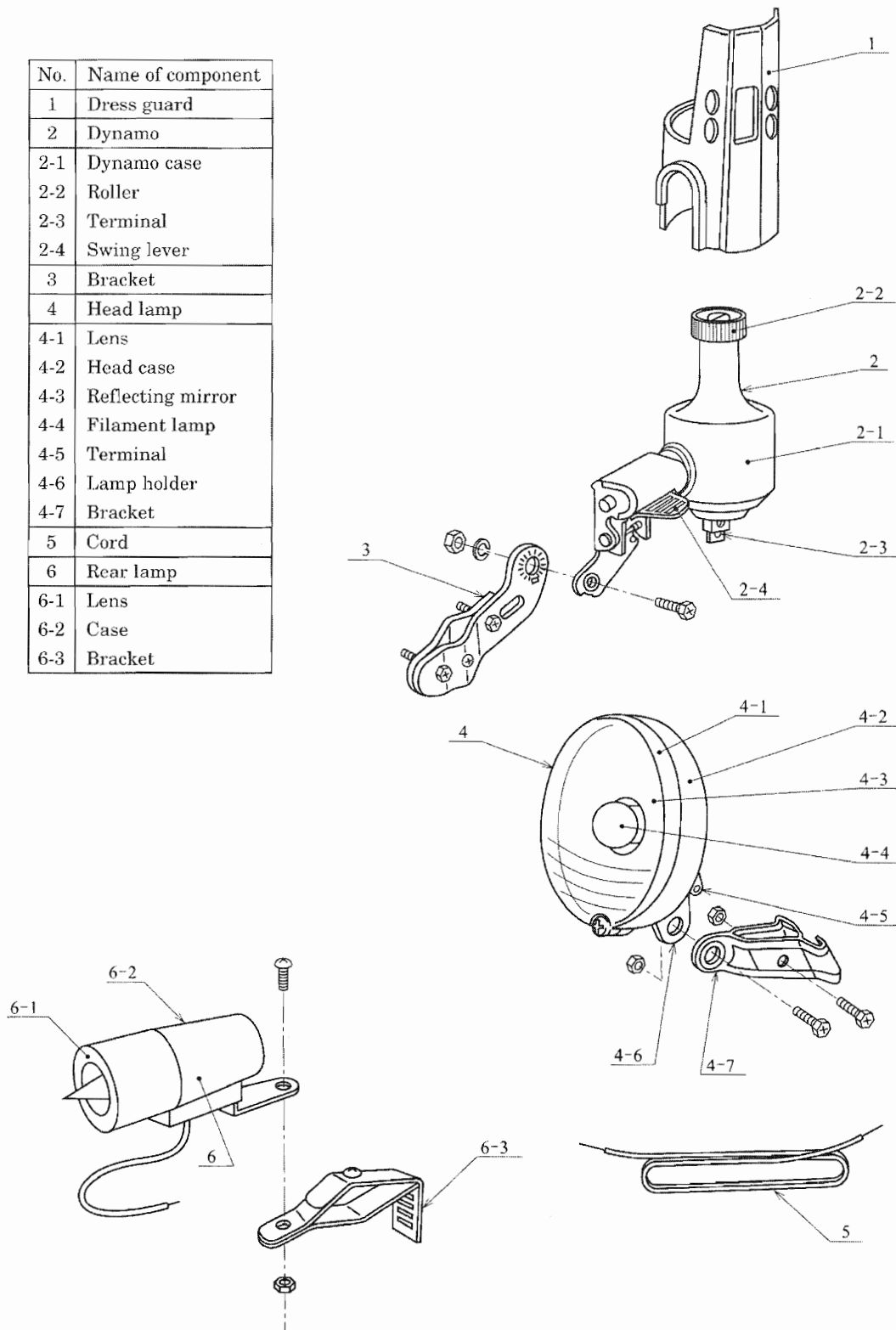


Figure 11 Type I
(Example of structure and names of components)

No.	Name of component
1	Dress guard
2	Dynamo
2-1	Dynamo case
2-2	Roller
2-3	Terminal
2-4	Swing lever
3	Bracket
4	Head lamp
4-1	Lens
4-2	Head case
4-3	Reflecting mirror
4-4	Filament lamp
4-5	Terminal
4-6	Lamp holder
4-7	Bracket
5	Cord

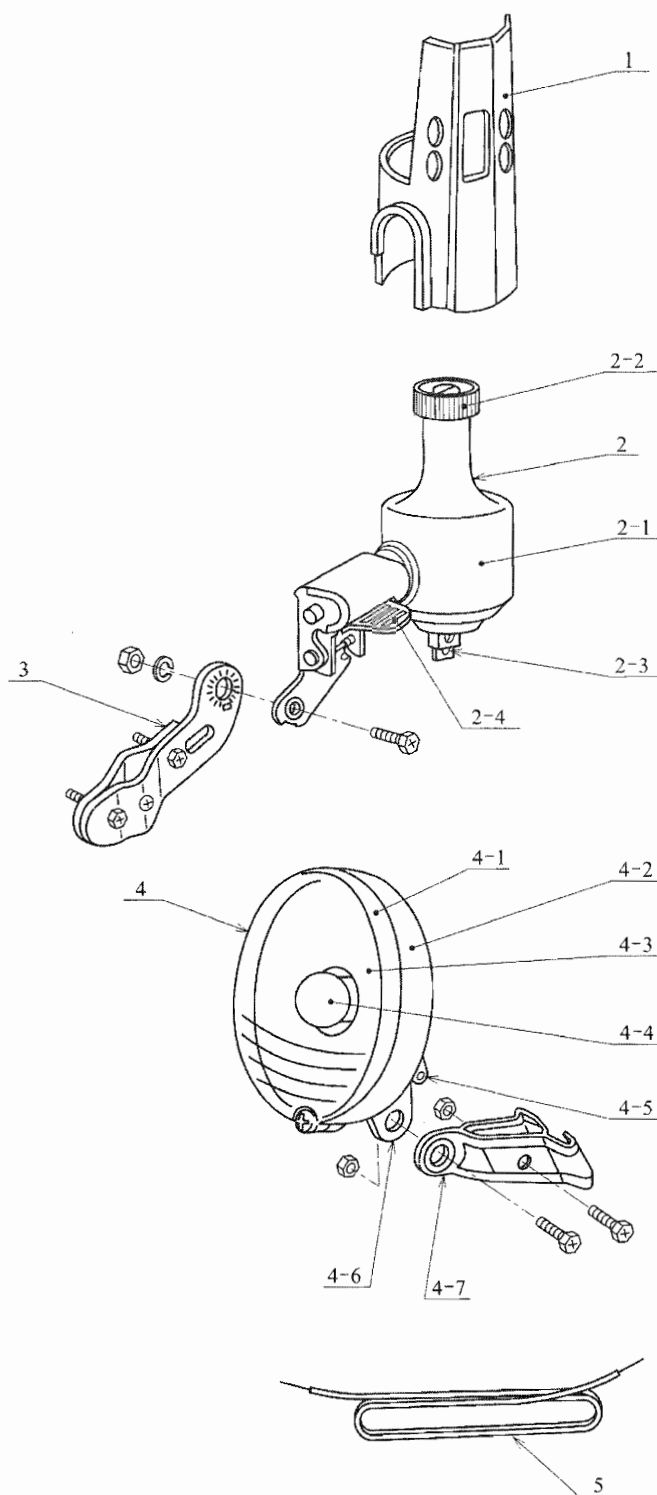
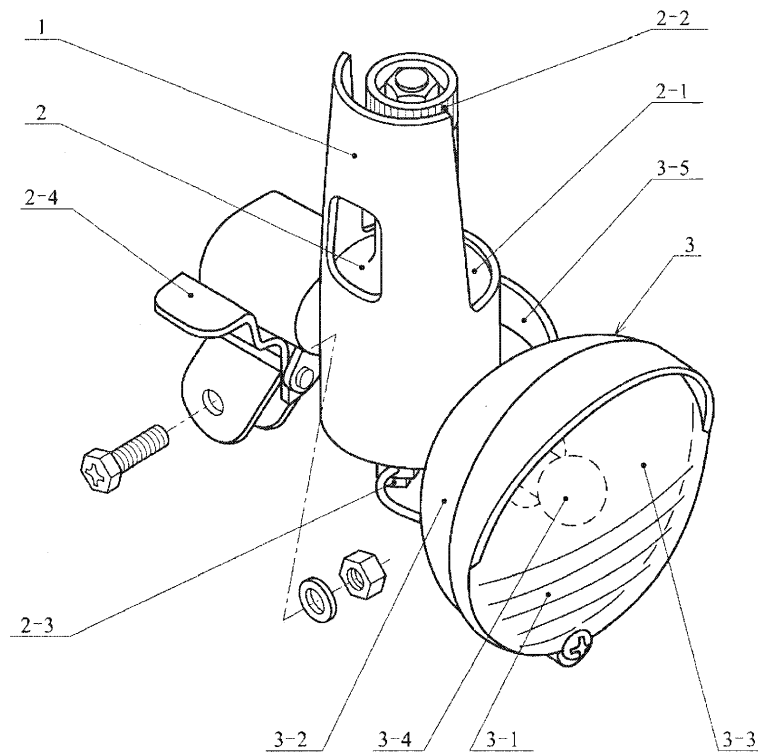


Figure 12 Type II (No. 1)
(Example of structure and names of components)



No.	Name of component
1	Dress guard
2	Dynamo
2-1	Dynamo case
2-2	Roller
2-3	Terminal
2-4	Swing lever
3	Head lamp
3-1	Lens
3-2	Head case
3-3	Reflecting mirror
3-4	Filament lamp
3-5	Lamp holder

Figure 13 Type II (No. 2)
(Example of structure and names of components)

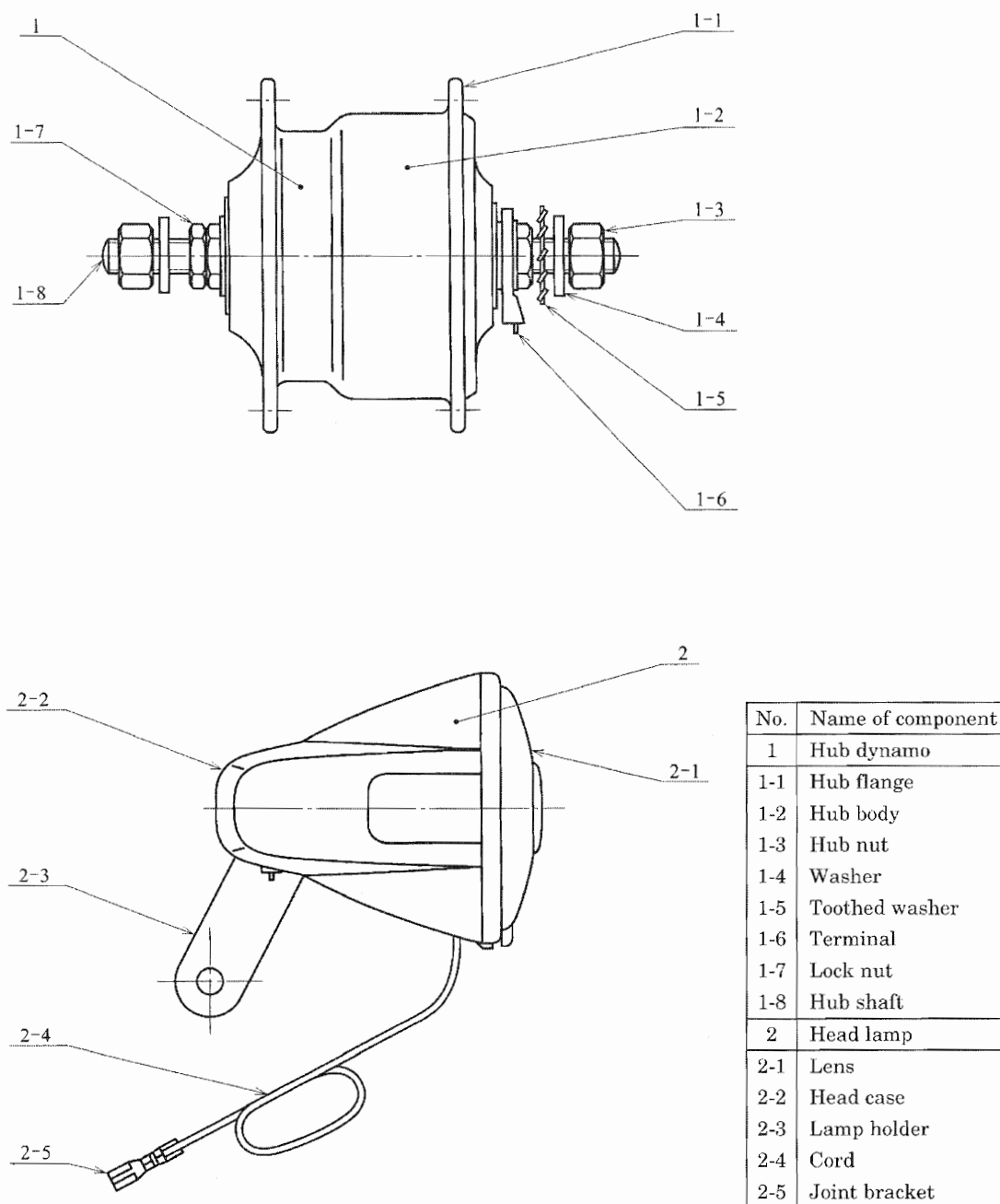


Figure 14 Type III
(Example of structure and names of components)

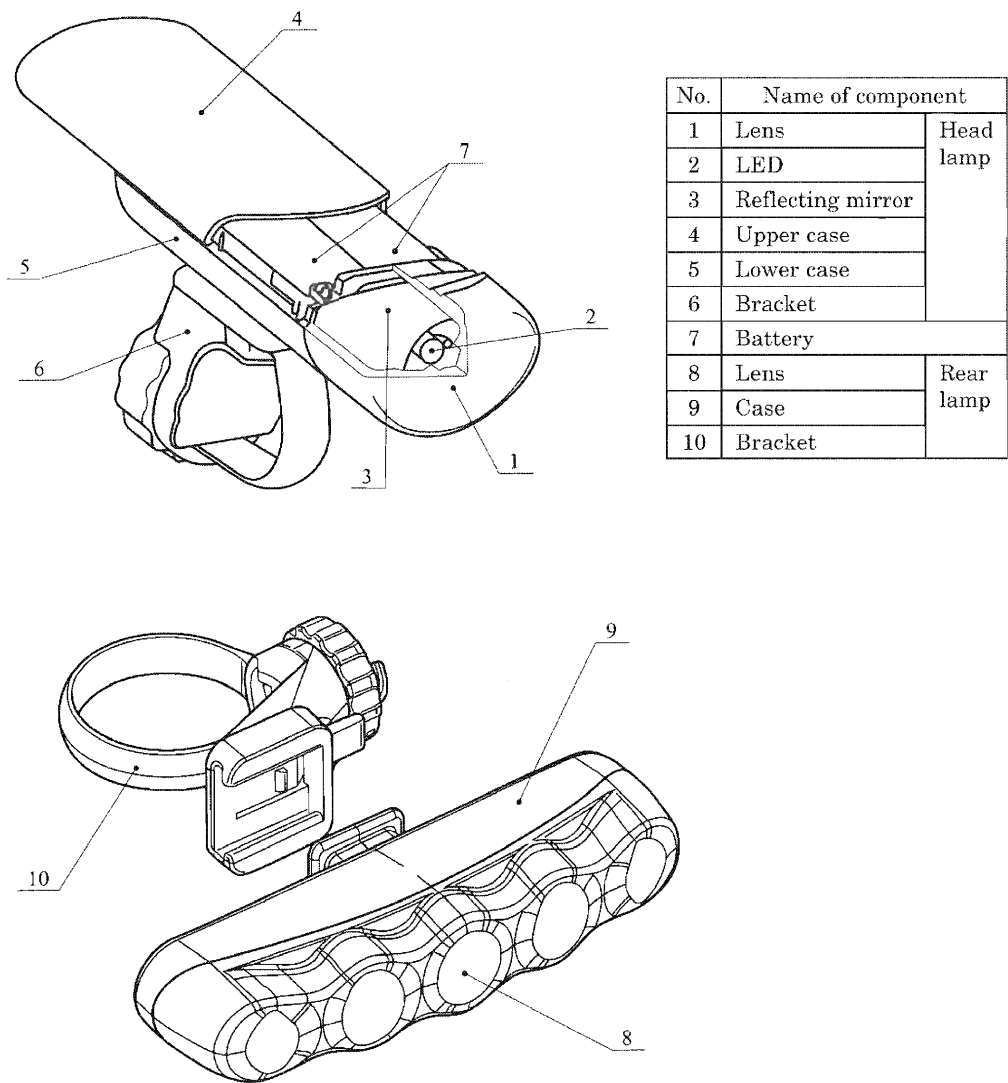


Figure 15 Type IV
(Example of structure and names of components)

Annex JA (informative)

Comparison table between JIS and corresponding International Standard

34
C 9502 : 2008

JIS C 9502:2008 <i>Lighting equipment for bicycles</i>				ISO 6742-1:1987 <i>Cycles—Lighting and retro-reflective devices—Photometric and physical requirements—Part 1: Lighting equipment</i>			
(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		Clause No.	Content	Classification by clause	Detail of technical deviation	
1 Scope	Specification of photometric and physical requirements, test method and marking requirements for lighting equipment used as mounted on bicycles. Not applicable to bicycle with drive assist device, which utilizes a battery for driving drive assist device also for power source of head lamp and rear lamp.		1	Specification of photometric and physical requirements, test methods and marking requirements for lighting equipment used as mounted on bicycles.	Addition	JIS adds requirements regarding head lamp and rear lamp for bicycle with a drive assist device.	There is no substantial technical deviation.
2 Normative references							
3 Terms and definitions	Definition of 14 terms including lighting equipment for bicycles.		4	Definition of 12 terms including cycle, bicycle and headlamp.	Addition	JIS adds terms of LED, standard light source, dynamo lamp, dynamo and hub dynamo. Two terms for a bicycle are defined in JIS D 9111.	JIS defines terms not specified in ISO Standard.

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		Clause No.	Content	Classification by clause	Detail of technical deviation	
4 Classification	Classification of lighting equipment for bicycles into 4 types according to power source and constitution.			—	Addition	JIS classifies lighting equipment for bicycles by constitution.	It is necessary for JIS to classify lighting equipment by constitution.
5 Name of component and constitution	Specification according to figure 11 to figure 15.			—	Addition	JIS adds component name and example of constitution.	JIS specifies component name, shape and example of constitution.
6.1.1.1 Minimum luminous intensity	Specification of 2 types of luminous intensity distribution characteristics. Test method 1 for oblong luminous intensity distribution characteristics and test method 2 for circular luminous intensity distribution characteristics.		5.1	Specification of test method 1 (oblong luminous intensity distribution characteristics)	Addition	JIS adds test method 2 (circular luminous intensity distribution characteristics).	The circular luminous intensity distribution characteristics has established as a basic distribution characteristics due to the difference in the road environment and ways of thinking of users in Japan.
6.1.1.2 Luminous intensity division and irradiation area division	a) Classification of luminous intensity into Grade 1 to Grade 5. b) Classification of irradiation area into standard and wide angle.			—	Addition	JIS adds luminous intensity division and the irradiation area division.	JIS classifies lighting equipment by performance.

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		Clause No.	Content	Classification by clause	Detail of technical deviation	
6.1.2 a) White light	Specification of chromaticity coordinates for white light. Specification of chromaticity coordinates for head lamp using LED as light source.		5.2.1	Specification of chromaticity coordinates for white light.	Addition	JIS adds the chromaticity coordinates for head lamp using LED as light source.	JIS expands the chromaticity coordinates corresponding to head lamp using LED as light source.
6.1.2 b) Selective yellow light	Specification of chromaticity coordinates for selective yellow light. Specification of area of chromaticity coordinates in figure 6 for each of colours.		5.2.2	Specification of chromaticity coordinates for selective yellow light.	Addition	JIS adds figure 6 (area of chromaticity coordinates of each colour).	JIS adds figure 6 corresponding to head lamp using LED as light source.
7.1 Ratings	Specification of rated voltage and rated output of dynamo lamp.		Annex	Specification of filament lamp.	Addition	JIS adds rated voltage and rated output.	JIS adds lamp types.
7.2 Output characteristics	Specification of 2 types of output characteristic: a) Applicable to dynamos classified as Type I; b) Applicable to dynamos classified as Type II and Type III.		7.2	Applicable to dynamos classified as Type I.	Addition	JIS adds dynamos classified as Type II and Type III.	It is difficult to fix the characteristics according to the difference in types.
8.1.1 Specification	Quotation of JIS of primary batteries.		8.1.1	Quotation of IEC Publication.	Alteration	JIS quotes 3 concrete standards of primary batteries.	There is no substantial technical deviation.

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		Clause No.	Content	Classification by clause	Detail of technical deviation	
8.1.2.1 Primary battery operated head lamp	Luminous intensity at measurement point A shall be 100 cd or more. Voltage after continuous 10 h full-load operation is approved.		8.1.2.1	Luminous intensity at measurement point A shall be not less than 100 cd.	Addition	JIS adds specification.	JIS and ISO Standard employ the same test method, but JIS approves a continuous operation to shorten the test time.
8.1.2.2 Primary battery operated rear lamp	Luminous intensity at measurement point HV shall be 0.25 cd or more. Voltage after continuous 10 h full-load operation is approved.		8.1.2.2	Luminous intensity at measurement point HV shall be not less than 0.25 cd.	Addition	JIS adds specification.	JIS and ISO Standard employ the same test method, but JIS approves a continuous operation to shorten the test time.
8.2.1 Specification	Quotation of JIS of secondary batteries.		8.2.1	Quotation of IEC Publication.	Alteration	JIS quotes 3 concrete standards of secondary batteries.	There is no substantial technical deviation.
10.1 Vibration resistance for lighting equipment	Head lamp, rear lamp and dynamo shall not become loose or detached during the test, when tested in accordance with 14.6.1 .		10.2.1	Specification of head lamp and rear lamp.	Addition	JIS adds specification of dynamo.	JIS adds specification to ensure quality.
10.2 Shock resistance for head lamp	There shall be no abnormality when tested in accordance with 14.6.2 .			—	Addition	JIS adds shock resistance test.	The addition is based on the possibility of falling of a bicycle or splashed stones.
10.7 Cyclic temperature change performance for lighting equipment	Clause 12 shall be conformed when tested according to 14.6.7 .			—	Addition	JIS adds cyclic temperature change test.	The addition is for evaluating the resin parts.

(I) Requirements in JIS		(II) Inter- national Standard number	(III) Requirements in Inter- national Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		Clause No.	Content	Classifi- cation by clause	Detail of technical deviation	
10.8 High-speed running perfor- mance of head lamp	6.1 shall be conformed when tested according to 14.6.8.			—	Addition	JIS adds high-speed running test for head lamp.	JIS adds specification to ensure quality.
11.1 General	There shall be no peeling off, rust or other defects on surface treated with plating or painting.			—	Addition	JIS adds plating or painting.	JIS adds specification to ensure quality.
12 Constitution	Specification of 12 items for constitution of lighting equipment for bicycles.			—	Addition	JIS adds constitution.	JIS adds specification to ensure quality.
13 Appearance	Specification of 3 items for appearance of lighting equipment for bicycles.			—	Addition	JIS adds appearance.	JIS adds specification to ensure quality.
14.1.2 Measure- ment of luminous intensity	Specification of the luminous intensity mea- surement method, mea- surement distance, test voltage, illuminance meter, measuring dura- tion and calculation of luminous intensity values in test method 1 (oblong luminous intensity distri- bution characteristics). Specification of test method 2 (circular lumi- nous intensity distribu- tion characteristics).		5.1	Specification of the luminous intensity measurement method and measurement distance in test method 1 (oblong luminous intensity distribution charac- teristics).	Addition	JIS adds test method 2 (circular luminous in- tensity distribution characteristics).	JIS adds requirements taking the reproduc- ibility of the test into consideration.

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		Clause No.	Content	Classification by clause	Detail of technical deviation	
14.1.3 Beam colour emitted from head lamp	Selection of test method from 2 test methods; a method to determine the chromaticity coordinates (x,y) according to JIS Z 8724 or a method of visual comparison.		5.2.3	Specification of a test method of visual comparison.	Addition	JIS adds a test method.	JIS adds requirements taking the reproducibility of the test into consideration.
14.2.3 Beam colour emitted from rear lamp	Selection of test method from 2 test methods; a method to determine the chromaticity coordinates (x,y) according to JIS Z 8724 or a method of visual comparison.		6.2.2	Specification of a test method of visual comparison.	Addition	JIS adds a test method.	JIS adds requirements taking the reproducibility of the test into consideration.
14.3 Operation characteristic test of dynamo	Specification of operation method, test load, voltmeter and ambient temperature as the test conditions.		7.1	—	Addition	JIS adds a test method.	JIS adds requirements taking the reproducibility of the test into consideration.
14.6.1 Vibration resistance test for lighting equipment	Selection of test method from 2 test methods; method 1 (test conditions and special exclusive test machine) and method 2 (test conditions only).		10.2.2	Test method 1 (test conditions and special exclusive test machine)	Selection	JIS adds a test method.	JIS adds a test method taking the situations in Japan into consideration.
14.6.2 Shock resistance test for head lamp	Drop of a steel ball vertically from the height of 1 m.			—	Addition	JIS adds a test method.	JIS adds specification to ensure quality.

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		Clause No.	Content	Classification by clause	Detail of technical deviation	
14.6.7 Cyclic temperature change test for lighting equipment	Specification of cyclic temperature change test between +50 °C and -20 °C.			—	Addition	JIS adds a test method.	JIS adds specification to ensure quality.
14.6.8 High-speed running test for head lamp	Specification of continuous running test, 30 min with the light turned on and 30 min turned off, at a bicycle speed of 30 km/h.			—	Addition	JIS adds a test method.	JIS adds specification to ensure quality.
14.7 Constitution and appearance test	Specification of checking method such as visual checking.			—	Addition	JIS adds a test method.	JIS adds specification to ensure quality.
15 Designation of products	Specification of designation of lighting equipment for bicycles.			—	Addition	JIS adds designation of products.	JIS adds the specification in order to avoid confusion in the market regarding the designation.
16.1 Marking on product	Specification of items to be marked with respect to head lamp, rear lamp, dynamo, battery case and secondary battery system.		11	Specification of items to be marked with respect to head lamp, rear lamp, dynamo and secondary battery system.	Addition	JIS adds items.	JIS adds specification to ensure safety.
16.2 Marking on package	Specification of items to be marked on package.			—	Addition	JIS adds items.	JIS adds specification to ensure safety.
17 Instructions	Specification of items to be described in instructions.		12	Specification of items to be described in instructions.	Addition	JIS adds items.	JIS adds items to be described by considering safety.

Overall degree of correspondence between **JIS** and International Standard (**ISO 6742-1**:1987): MOD

NOTE 1 Symbols in sub-columns of classification by clause in the comparison table indicate as follows:

- Addition: Adds the specification item(s) or content(s) which are not included in International Standard.
- Alteration: Alters the specification content(s) which are included in International Standard.
- Selection: Provides an alternative choice by adding the specification content(s) of equal status, which may be used as an alternative to that given in the original International Standard.

NOTE 2 Symbol in column of overall degree of correspondence between **JIS** and International Standard in the comparison table indicates as follows:

- MOD: Modifies International Standard.

Errata for JIS (English edition) are printed in *Standardization Journal*, published monthly by the Japanese Standards Association, and also provided to subscribers of JIS (English edition) in *Monthly Information*.

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